Micro Control Systems

APPLICATION NOTE
APP-067

UPGRADING MCS-MAGNUM Rev 6.x to 7.1 and MAGNUM KEYPAD/DISPLAY Rev 4.x to 7.0

(I^2C Bus Protection)

RESTRICTIONS

UNDER NO CIRCUMSTANCES IS THIS MODIFICATION TO BE MADE IN THE FIELD

CHANGES MUST BE MADE AT AN ELECTRONICS SERVICE FACILITY AND TESTED

Revision History

Date	Author	Description
04/01/11	John Walterick	Created Application Note

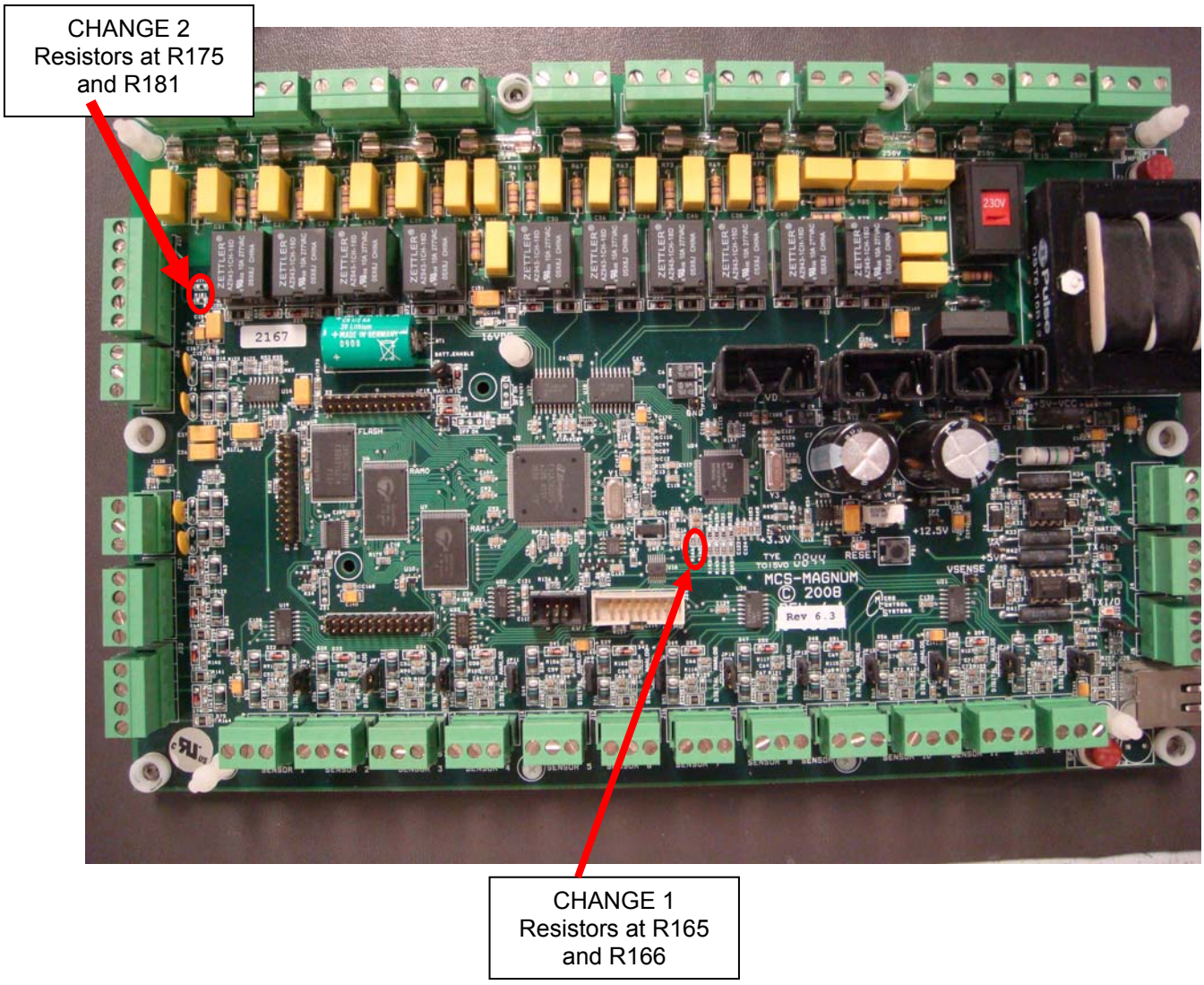
1. General Concept

The MCS-Magnum Revision 7.x and higher is designed to be used with the Magnum Keypad / Display Revision 7.x and higher. The I²C High Speed communications bus has been modified to use +12vdc instead of +5vdc. This improves the Magnum's I²C Bus communication system's immunity to external electrical noise.

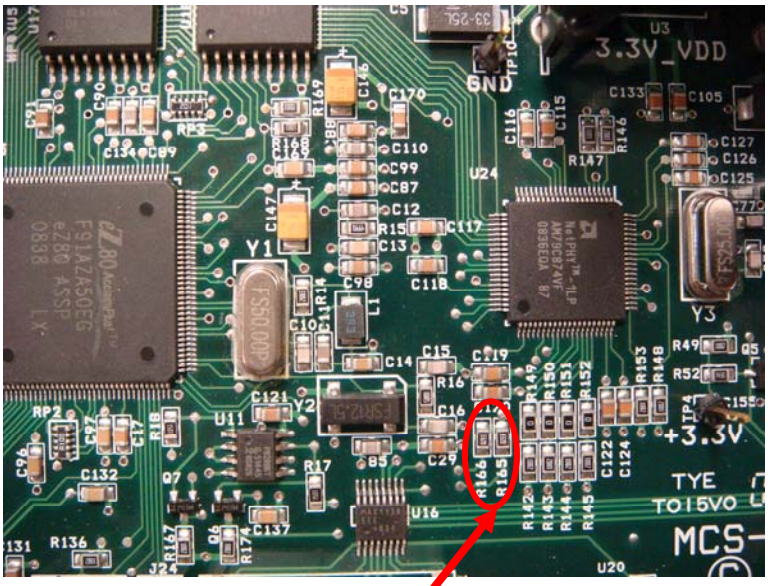
You cannot mix a Revision 7.x Magnum and higher with a Magnum Keypad/Display unit that is less than Revision 7.x

2. MCS-MAGNUM Modifications (Top Side)

a. Two Locations on Revision 6.x are Changed on the Top Side

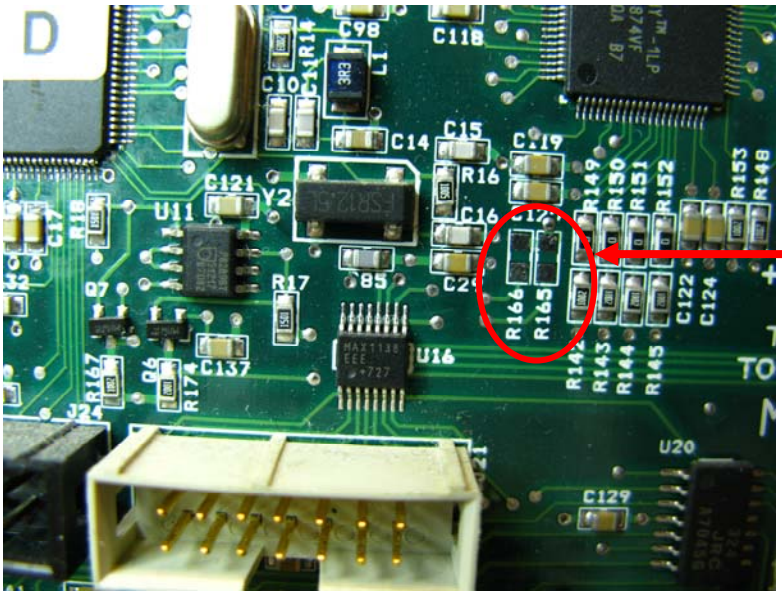


b. CHANGE 1- Remove Surface Mount Resistors R165 and R166



BEFORE CHANGE PHOTO

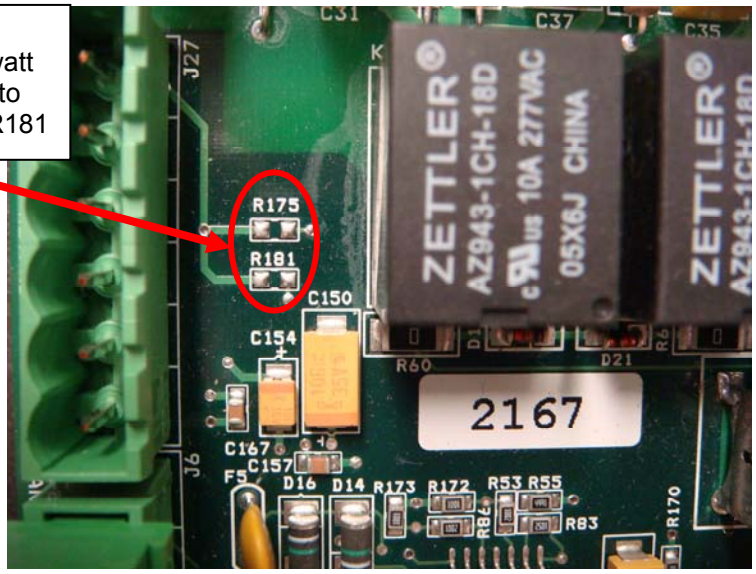
CHANGE 1 - Remove surface mount resistors R165 and R166



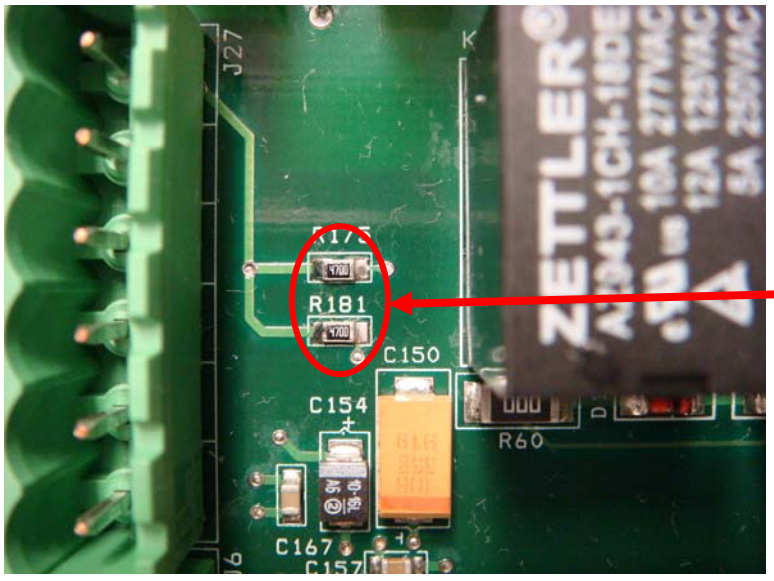
AFTER CHANGE PHOTO

c. CHANGE 2- Add Two 470Ω 1/8 watt 1% 0805 Surface Mount Resistors at Locations R175 and R181

CHANGE 2-
Add two 470Ω 1/8 watt 1% 0805 resistors to locations R175 and R181



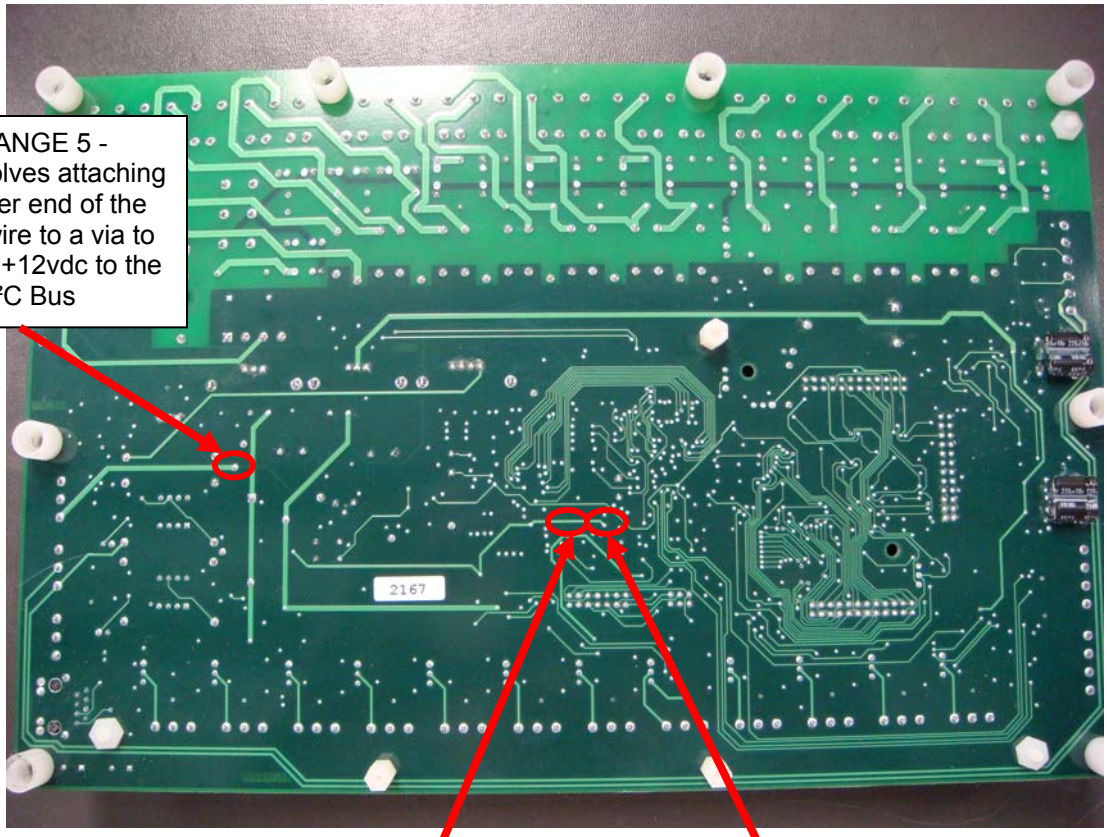
BEFORE CHANGE PHOTO



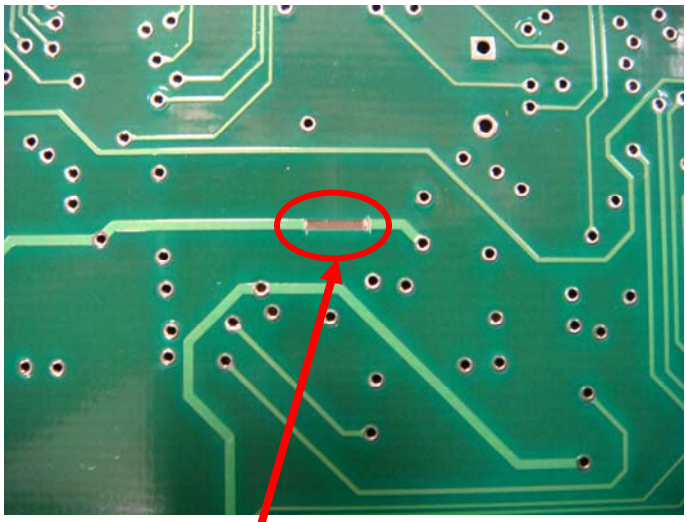
AFTER CHANGE PHOTO

3. MCS-MAGNUM Modifications (Bottom Side)

a. Changes to Bottom Side

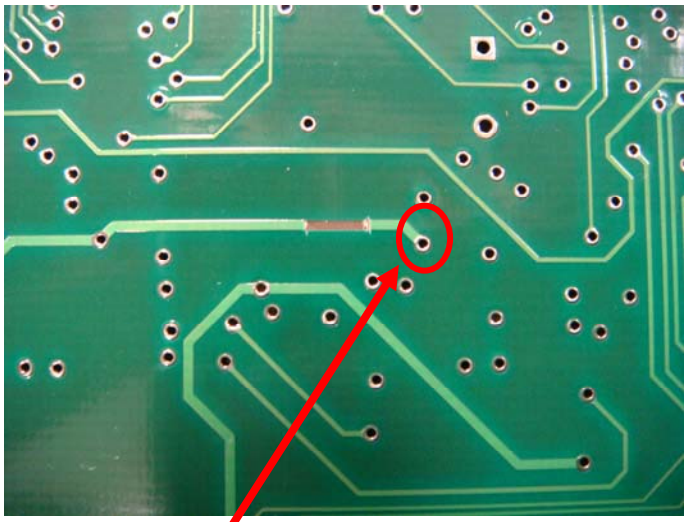


b. CHANGE 3- Cut the +5vdc Trace to the I²C Bus



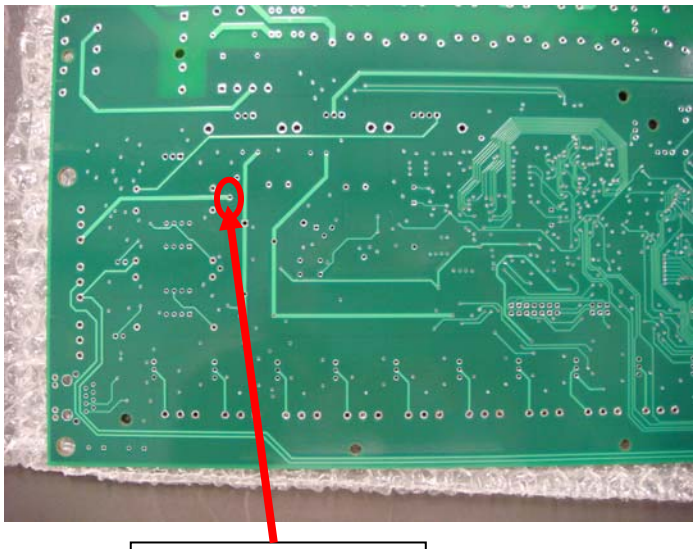
CHANGE 3 - Cut the +5vdc trace to the I²C Bus

c. CHANGE 4 – Attach One End of a Green Wire to the I²C Bus

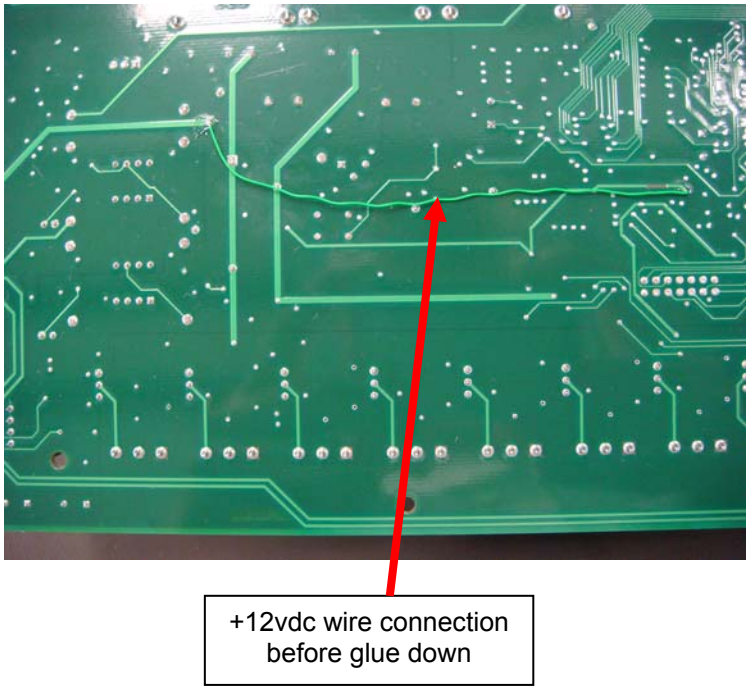


CHANGE 4 - Attach one end of a green wire to the I²C Bus

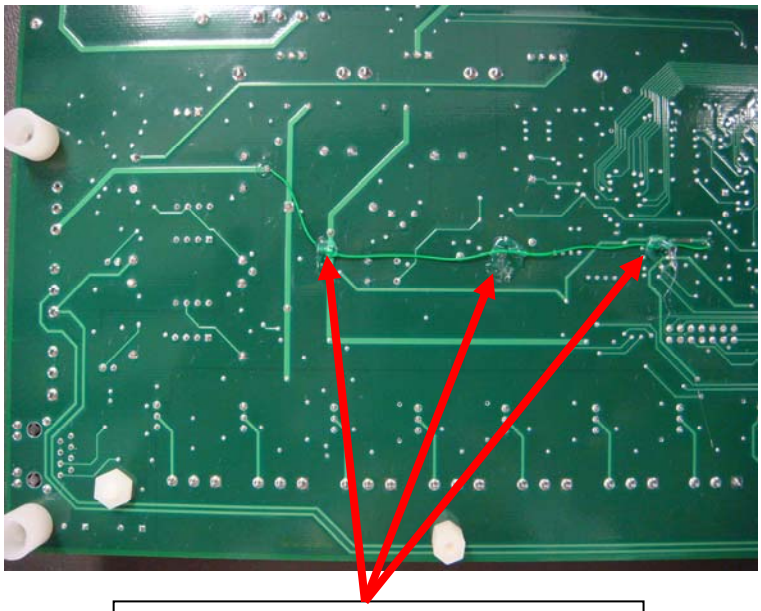
d. CHANGE 5 – Attach Other End of Green Wire to +12vdc Via



e. Route +12vdc Wiring (without Hot Glue)

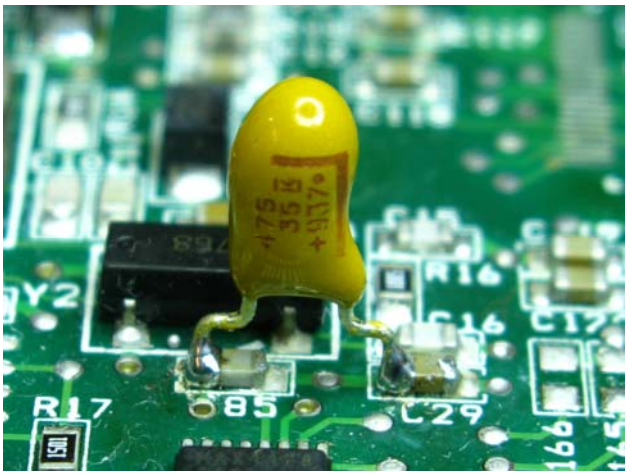


f. Completed +12vdc Wiring (with Hot Glue)



Use Hot Glue in three locations
Be sure wire is not touching any sharp items on bottom of board

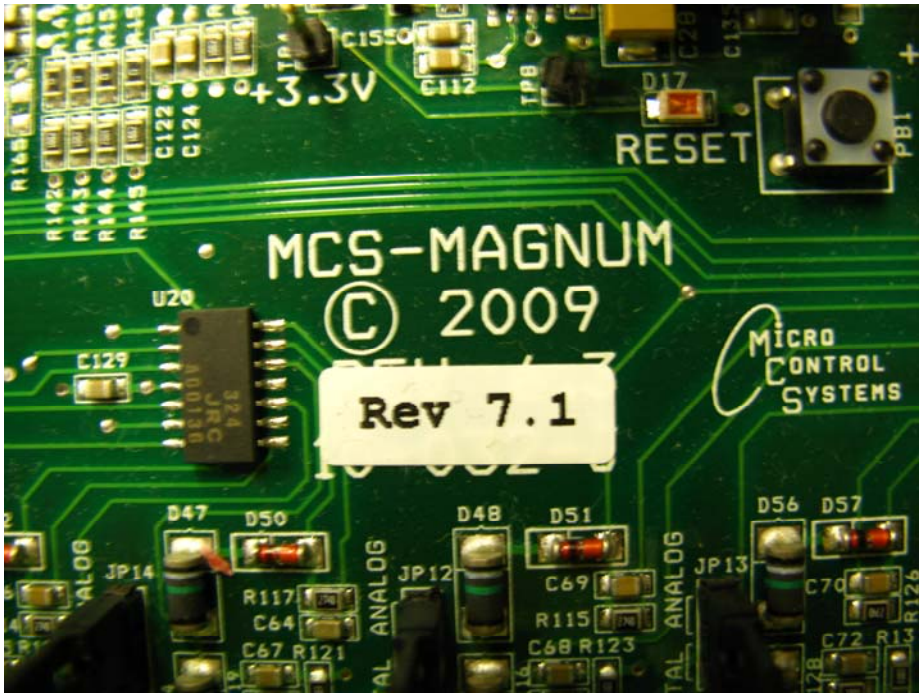
4. Addition of 4.7uf 35vdc Tantalum Capacitor to MCS-MAGNUM Top Side



Piggy back capacitor on left side of C85 and left side of C29

POSITIVE PIN OF TANTALUM CAPACITOR MUST BE CONNECTED TO LEFT SIDE OF C29!

5. Magnum Completion (Label & MCS INFO)

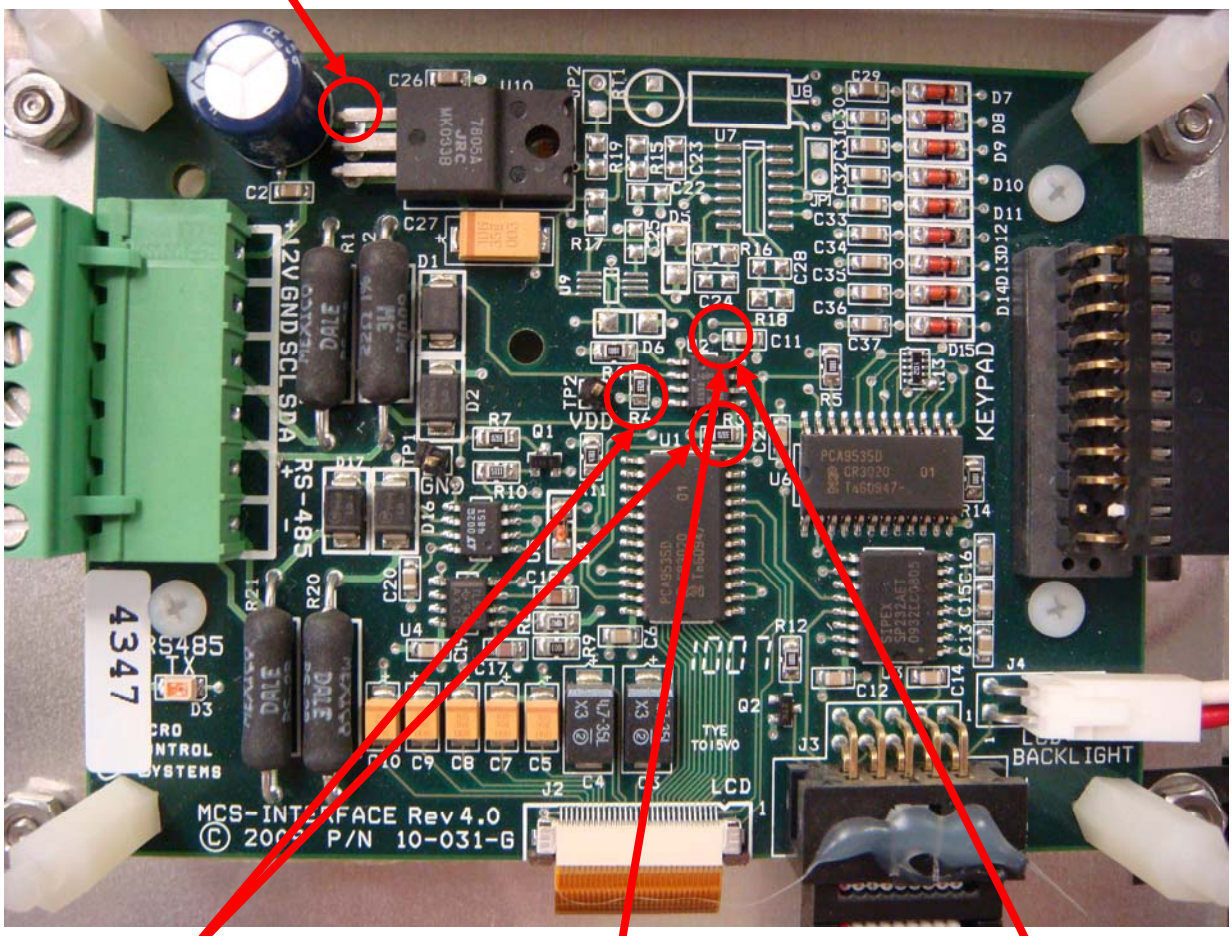


1. Add Rev 7.1 label
2. Record serial number and forward to MCS

6. Magnum Keypad/Display Modifications

a. Revision 4.x Keypad/Display

CHANGE K4 -
Attach other end of green wire to pin 1 on regulator U10

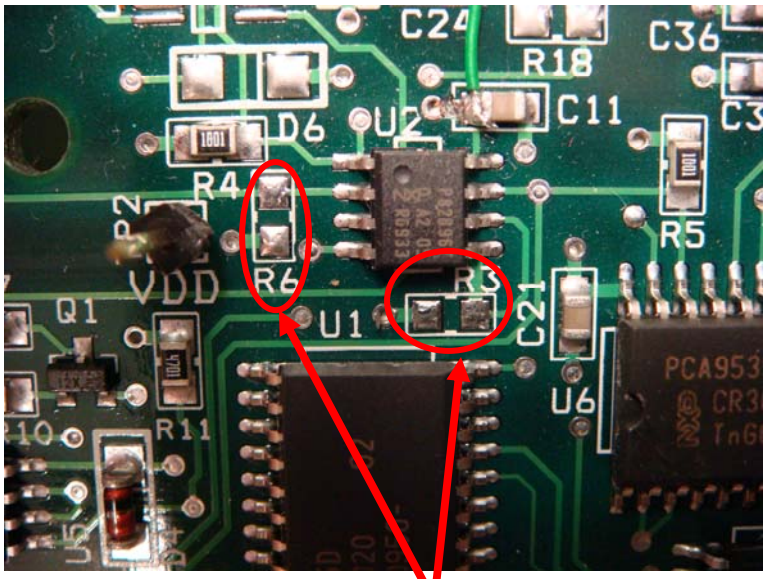


CHANGE K1 -
Remove resistors R3 and R6

CHANGE K2 -
Cut trace left side of C11

CHANGE K3 -
Attach one end of green wire to left side C11 to +12 vdc.

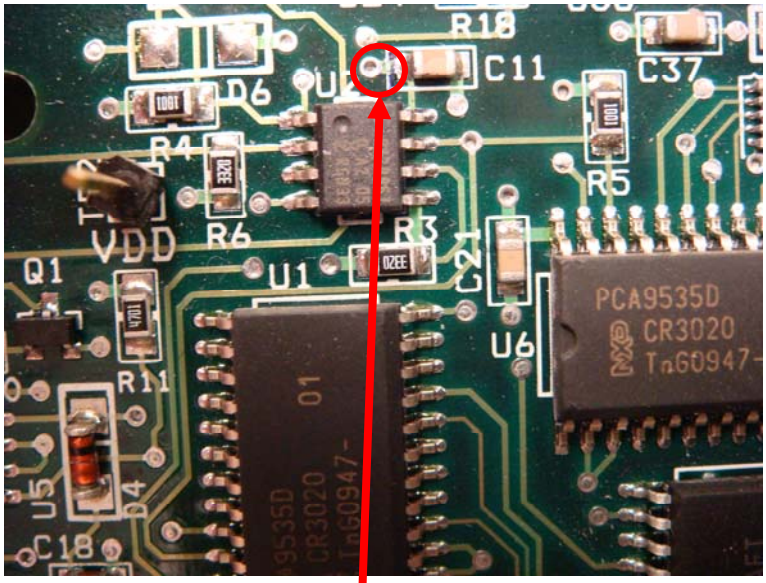
b. CHANGE K1- Remove Resistors R3 and R6



AFTER CHANGE MADE

CHANGE K1 -
Remove resistors R3 and R6

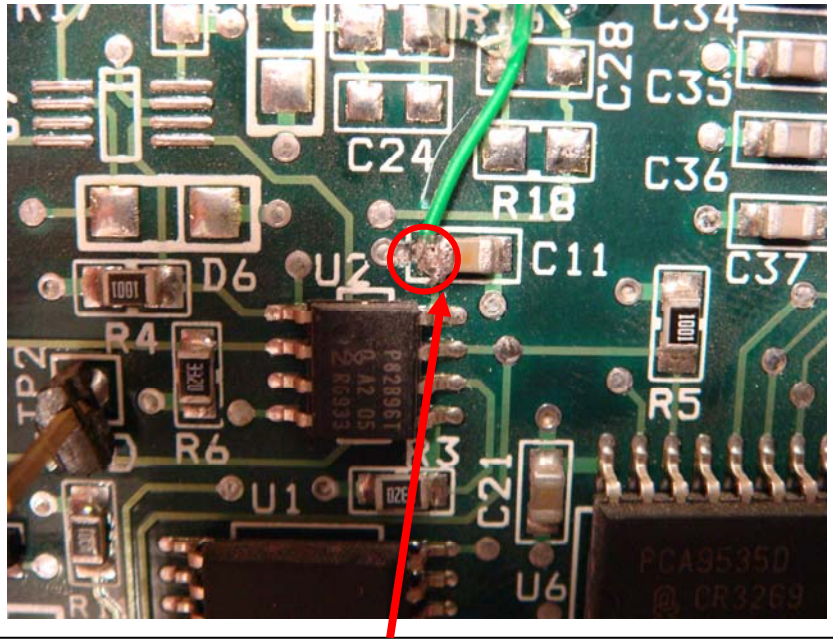
c. CHANGE K2 - Cut +5vdc Trace to C11



AFTER CHANGE MADE

CHANGE K2 -
Cut +5vdc trace to left side of C11

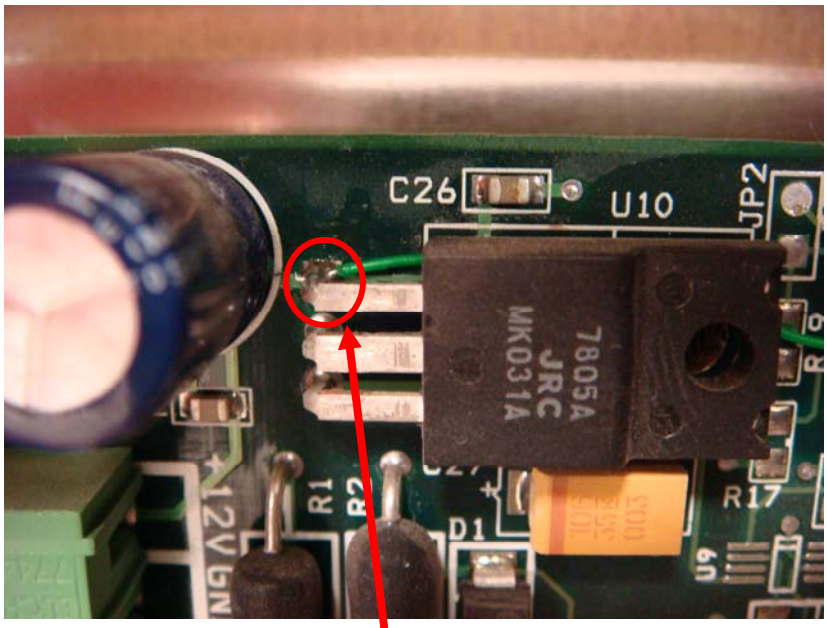
d. CHANGE K3- Connect +12vdc Wire to C11



AFTER CHANGE MADE

CHANGE K3 -
Attach one end of a green wire to the left side of C11
MAKE SURE THERE IS NO SOLDER BRIDGE OR CONNECTION FROM GREEN WIRE TO VIA ON LEFT!

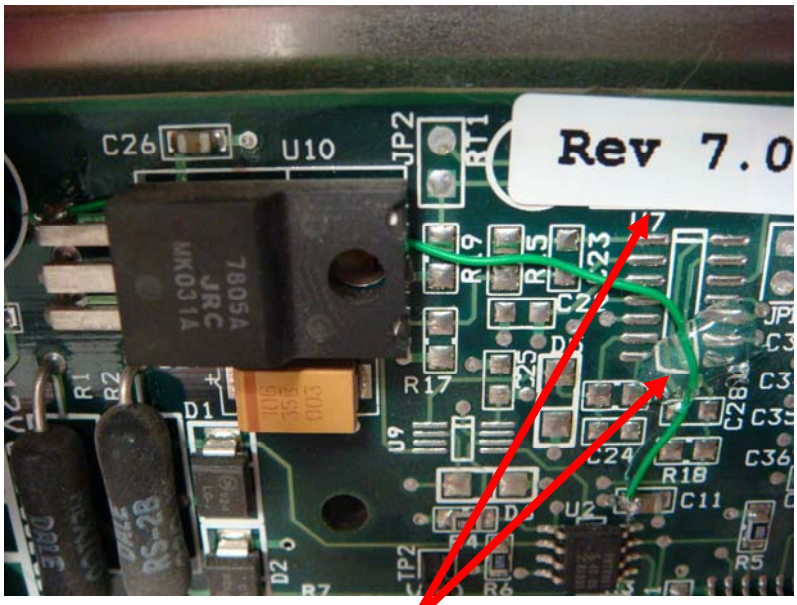
e. CHANGE K4- Connect +12 vdc Wire to Pin 1 of Regulator U10



AFTER CHANGE MADE

CHANGE K4 -
Attach the other end of the green wire to pin 1 of regulator U10

f. CHANGE K4- Glue Down Green Wire and Add Rev 7.0 Label



CHANGE K5-
Glue down green wire and install Rev 7.0 label

1. Place Rev 7.0 label
2. Record board serial number and forward to MCS